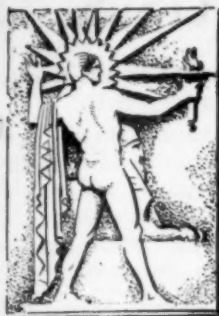


JUL 20 1929



SCIENCE NEWS-LETTER

The Weekly Summary of Current Science

A SCIENCE SERVICE PUBLICATION



\$5 a year

15c a copy



July 20, 1929



A FLASH IN THE NIGHT

Brilliant Meteor Photographed from Prague

(See page 27)

Vol. XVI

No. 432

South Africa to Welcome Scientists

General Science

Famous scientists, not only from England, but from the United States as well, are now beginning to gather at Cape Town, South Africa, for what will probably be one of the most important of scientific meetings ever held south of the Equator. This will be the South African meeting of the British Association for the Advancement of Science, which will open on Monday evening, July 22. Sessions will continue there until Saturday, July 27, when the members will travel to Johannesburg and Pretoria. Further sessions will be held in those cities until Monday, August 5. South African scientific bodies, especially the South African Association for the Advancement of Science, will hold joint sessions with the British Association.

Sun Science Institute

Archæology

What the sun has meant in human life, from the time when it was worshipped as a god to the present day, is to be a feature of the exhibits at an international congress of the new science of actinology to be held in Paris from July 22 to July 27, 1929, under the auspices of the French Institut d'Actinologie.

Aside from exhibits showing the progress already made in this new branch of medicine, the historic review of primitive man's figurative recognition of what modern science has just demonstrated in the last few years in a practical way, will be one of the most interesting features of this scientific meeting.

Mrs. Zelia Nuttall, well-known American archaeologist, for many years resident in Mexico, will describe her various discoveries in regard to sun worship among such ancient American civilizations as the Aztecs, Mayas and Incas.

Representatives from other countries are expected to present new facts on the sun cult among other races in other nations.

Science News-Letter, July 20, 1929

Meetings of the British Association are held every year, usually in the British Isles in the late summer, but occasionally meetings are held in the British dominions. The first was in 1884, in Montreal, Canada. In 1897 a meeting was held in Toronto, in 1909 one in Winnipeg and in 1924 another took place in Toronto. In 1905 the first meeting was held in South Africa, with Sir George Darwin as president. An Australian meeting was in session in 1914 when the war broke out, which added to the thrills of returning to England for the members. It was at this meeting that the late H. G. J. Moseley announced his researches on the relation between the X-ray spectra and weights of atoms of elements. He was killed in the war the next year,

Hoover in Mental Congress

Psychiatry

President Herbert Hoover will be the honorary president of the First International Congress on Mental Hygiene which will be held May 5 to 10, 1930, in Washington. The national committees for mental hygiene in this country and Canada, together with the national societies for mental hygiene in all other countries in which the movement is organized, are joining in sponsorship of the first world meeting of those concerned with the health of the mind.

Science News-Letter, July 20, 1929

In This Issue—

Stones from Heaven, p. 27—Blind-fold Test Flops, p. 31—Medicine Marches, p. 31—New Danger in X-Rays, p. 31—Sulphur and Scurvy, p. 32—Brain Doctoring Succeeds, p. 32—Early Measles, p. 33—Too Many Carrots, p. 34—Plant Oaks, p. 35—Geologists Abroad, p. 35—Dr. Smith Comes of Age, p. 35—Truculent Jack-rabbit, p. 36—Cancer and Cosmic Rays, p. 36—A Shocking Omnibus, p. 36—Costly Mice, p. 37—Hard on Hearing, p. 37—Right-Eyed, p. 37—Books, p. 39.

and B Sta., N. W., Washington, D. C. Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

Subscription rate—\$5.00 a year postpaid. 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Special reduced subscrip-

tion rates are available to members of the American Association for the Advancement of Science.

Advertising rates furnished on application. Copyright, 1929, by Science Service, Inc. Reproduction of any portion of the SCIENCE NEWS-LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service, details and samples of which will be gladly sent on request.

but his method has led to the discovery of several new elements. Sir Thomas Holland, famous British geologist and rector of the Imperial College of Science, will preside over the meeting. He succeeds Sir William Bragg, who was president last year at the Glasgow meeting. His address will deal with "The International Relationship of Minerals", and will be given at Johannesburg on Wednesday, July 31. At the opening session in Cape Town on the evening of July 22, the Earl of Athlone, governor-general of South Africa, will welcome the members and Prof. Jan H. Hofmeyr, president of the South African Association will speak on "Africa and Science".

Other important addresses will be by Lord Rayleigh, on "Some Problems of Cosmical Physics, Solved and Unsolved"; by Prof. George Barger, on "The Relation of Organic Chemistry to Biology"; by Prof. S. M. S. Watson, before the zoology section, on "Adaptation"; by Prof. F. C. Lea, on "Science and Engineering"; and by Prof. F. C. Bartlett on "Experimental Methods in Psychology".

Public lectures will be given by Prof. A. S. Eddington, on "The Interior of a Star"; by Sir Ernest Rutherford, on "The Structure of the Atom"; and by Prof. Julian Huxley on "Evolution". At one of the astronomical sessions, Dr. W. J. Luyten, of the South African station of the Harvard College Observatory, will describe his researches on the newly discovered 70-ton meteorite in South Africa.

Among the American scientists expected at the meeting are Prof. Bailey Willis and Prof. E. C. Franklin, of Stanford University; Prof. A. S. Hitchcock, of the Smithsonian Institution; Prof. Douglas Johnson, of Columbia University; Prof. Agnes Donohugh, of White Plains, N. Y., and Dr. George A. Dorsey, of New York City.

Science News-Letter, July 20, 1929



SCIENCE NEWS-LETTER, The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by Watson Davis.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st

Falling Meteors Might Wipe Out Cities

Astronomy

By JAMES STOKLEY

Flashes of light in summer skies. "A shooting star", we say. A meteor, dead fragment of a star, has burned itself out in our atmosphere.

But someday there may be the roar of a million express trains. A massive chunk of sky dust may project itself out of space and land in the middle of a great city. Thousands would perish, the effects of aerial bombs will fade into insignificance. More terrific than war would be the effect of a single large meteorite that smashed into civilization.

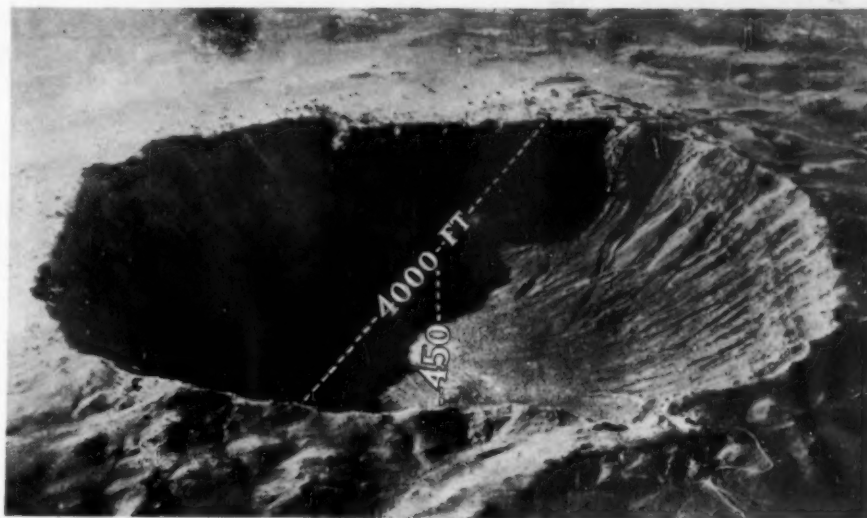
Such possibilities lie in the minds of enthusiastic amateur astronomers, who have taken as their pleasure the increase of knowledge about meteors. Without telescopes, with bare eyes and keen senses, they chart the meteoric flashes of the night.

More interesting to them than possible world disaster is the hint that meteors contain of the existence of other solar systems, other groups of planets surrounding the stars of the sky.

And how do they come to such conclusions?

A few months ago there was discovered in South Africa a huge meteorite. So far, its size can only be estimated, as it is still almost entirely buried in the earth. However, Dr. W. J. Luyten, stationed at the Harvard College Observatory's South African branch, has estimated it at fifty to seventy tons.

In the American Museum of Natural History, in New York City, is the famous Ahnighito meteorite, which weighs thirty-six and a half tons, until the discovery in South Africa the largest known in the world.



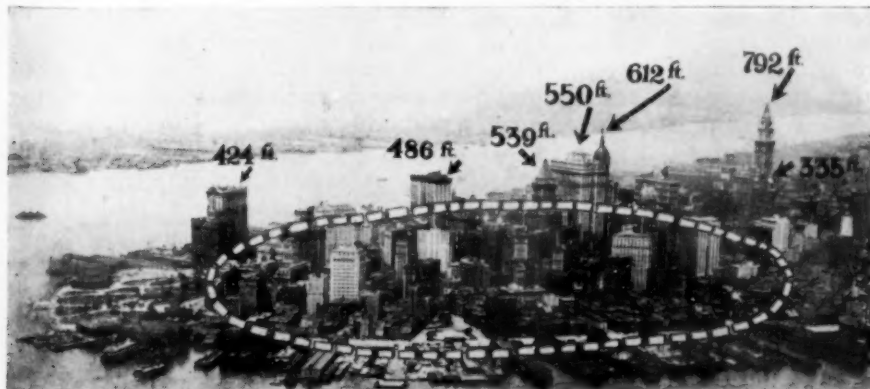
THE GREAT METEOR CRATER IN ARIZONA, hollowed out of the desert about 2000 years ago when a compact cluster of meteors, the head of a small comet, hit the earth. It is seen here from an airplane

But even these huge celestial projectiles are doubtless small compared with two other famous falls. On June 30, 1908, at seven o'clock in the morning, in the Yenisei Province of Siberia, a swarm of meteorites—really the nucleus of a small comet—was observed to fall. Though a sparsely settled region, hundreds of people saw it, still more heard the thunderous roar that accompanied its passage through space. A seismograph at Irkutsk, used for recording earthquakes, revealed the vibrations caused when the meteors hit ground.

Over an area of a couple of miles in diameter the ground was pitted with hundreds of holes like shell craters. The size of the individual meteors is problematical, as the place where they landed is swampy, and it

was not until twenty years later that a Russian scientific expedition made a thorough examination of the spot. It is planned to dig for the meteors during the coming year. On account of the softness of the ground in summer, digging must be done in the winter, when it is frozen hard, so it will not be an easy undertaking. But probably it will be found that many of the individual bodies are far larger than any known at present.

The effect of this cometary collision was not confined to the immediate bombardment that produced the shell holes. As the swarm entered the earth's atmosphere, it piled up a huge mass of air in front of it. So fast was it moving that the air had no time to sweep aside, and was highly compressed and heated. When the meteorites hit the ground, the air then rushed to all sides. Barographs at Irkutsk and Kirensk recorded this air wave as it reached these cities. For miles on every side it swept through the forests, levelling trees before it, and actually scorched them as with a blow torch. A herd of domesticated reindeer nearby was annihilated. A small shack containing some tools and cooking utensils was destroyed, and many of the metal objects melted. Over a still larger area, perhaps forty miles in diameter, trees that were not felled showed signs of the forest fire. The trees that were knocked over all (Turn to next page)



WHAT WOULD HAPPEN TO NEW YORK if hit by a meteor the size of the one causing the meteor crater in Arizona may be imagined from this view. The ellipse covers the same area as the actual crater shown in the upper photograph

Falling Meteors Might Wipe Out Cities—Continued

pointed away from the center of the fall. Fortunately, no human beings were in the affected area, as far as we know.

But even the Siberian meteorites are probably smaller than the famous one that caused the meteor crater in Arizona. Nobody knows when this fell—perhaps it was thousands of years ago, but it has left evidence of its fall in the form of a great crater, four-fifths of a mile across the top and about four hundred and fifty feet deep below the surrounding plains. Piled up around the outside is a rim of quartz and rock fragments so that it has an inside height of about five hundred and seventy feet. A company has been formed, and is now at work trying to locate the mass of iron of the meteor itself. It may prove that this was a swarm of meteors, but it was much more compact than the 1908 one in Siberia.

Thus, on a number of occasions, huge masses of stone or iron have landed on the earth from outer space.

What would have happened if one of them, instead of landing in an inaccessible region of South Africa, the heart of Siberia, or the deserts of Arizona, had happened to hit a populous city?

Suppose that in 1908 the meteor had reached the earth five hours later. Then the earth would have turned enough so that the heavenly projectile would have hit northern Sweden or Norway, with terrible loss of life. Had it been some ten hours later, and a little farther south, it might easily have hit New York and caused a catastrophe, the like of which the earth has never known.

Weather we can predict, and eventually may control; even earthquakes may in time be predicted, but the great meteorite is one potential danger that is ever with us, no matter how rare it may be. A great meteorite may fall on your house while you are reading this; on the other hand, one may never fall anywhere near your location for millions of years.

So the scientist does not worry about what damage a meteorite might do. Instead, he devotes his time to studying them, finding what they are made of, and learning their significance in the scheme of the universe.

At the University of Pennsylvania is one of the meteor authorities of the world. A man in his forties, and looking even younger, with a southern drawl that reminds one of the fact that he is a native Virginian, Prof.



PROF. CHARLES P. OLIVIER, Director of the Flower Observatory of the University of Pennsylvania, and president of the American Meteor Society

Charles P. Olivier, is the author of the standard work in English on the subject of meteors. Recently he spoke before the Franklin Institute in his adopted city, and told of his latest conclusions on his favorite subject. Perhaps the most striking of these is that the meteors which continually bombard the earth are messengers to earth from other stellar systems carrying the assurance that our sun, and its attendant planets, are not alone among such systems in the heavens.

When a meteor hits the earth's atmosphere it is moving so rapidly that the friction with the earth's atmosphere causes it to be heated and to glow. The effect is the familiar shooting star. Sometimes it is so bright that it is called a fire-ball, but a fire-ball is simply a very bright shooting star. In the vast majority of cases, a shooting star, or fire-ball, is completely burned by the atmospheric friction. The iron, or other elements in it is converted to oxides and dissipated into the air. Occasionally one is so large that it reaches the surface of the earth and is called a meteorite.

Coming as unexpectedly as they do, exact determination of the way a meteor is moving is seldom possible. But under Prof. Olivier's direction there has been formed a very active

group of amateur scientists, known as the American Meteor Society. Its members watch particularly for shooting stars, and report them to him. From a large number of such observations of the paths they take it is possible to calculate just the way they are moving and their speed. Such work as this has shown that most of the meteors are moving in the curve known as a hyperbola.

If you cut a slice out of a cone, you get one of three kinds of curves, all of which are grouped together under the general name of "conic sections". If the cut is perpendicular to the axis it is a circle, which is, to the mathematician, a special form of an ellipse. If the cut is parallel to the opposite side the curve is a parabola, while if it is away from the opposite side and away from the apex the result is a hyperbola.

All of the heavenly bodies that belong to or enter the solar system move in one of these three curves. The planets themselves move in ellipses, so do most of the known comets. A few comets move in parabolas, but it turns out that most of the meteors are moving in hyperbolas. This latter fact is more than a curious bit of information, for only bodies originating in our own solar system can move in ellipses. Motion in a hyperbola proves that the body entered the solar system from outer space, and so we have evidence that the meteors are really visitors from some other part of the universe. When they are, they enter the atmosphere with a speed of at least 26 miles a second. But not all meteors are such visitors. Many of them, especially those of the great showers, such as the ones that occur in November and August, do move in elliptical paths. This shows that they are natives of the solar system and have been born in a way similar to the birth of the earth itself.

Probably this birth occurred when a passing star approached close to the primeval sun. By its gravitational attraction, the passing star pulled out large masses of material from which were formed the eight planets, the thousand or so little planets, or asteroids, and many of the comets and meteors.

Aside from their motion, the strange meteors, and those of our own family, are the same. And this brings us to the conclusion, as Prof. Olivier expressed it, "That planets also, not unlike our own, (Turn to next page)

Falling Meteors Might Wipe Out Cities—Continued

circulate about other stars, as well as these meteorites, which alone, with an occasional comet, can escape from their original home and bring this message to us."

So here is evidence, for the first time in astronomical history, that our solar system is not alone in creation. In a few months the star Capella will appear in the constellation of Auriga, the charioteer, in the northeastern sky. This is a yellow star, the spectroscope shows it to be similar in composition to the sun. Perhaps surrounding Capella is a retinue of planets. Presumably on one of these planets conditions would be similar to what they are on the planets of our own system.

It is conceivable that these planets might also be inhabited, but the astronomer who now has the first meager evidence that there are other solar systems hesitates to express an opinion.

The study of meteors has an interesting history, beginning with veneration, passing through a stage of skeptical disbelief and finally reaching the present scientific attitude towards them.

The earliest records are of meteors falling in China in the years 687 and 644 B. C. During the following six centuries these annals record 14 others. Various classical writers mention them and that they were supposed to be sacred.

In more recent years they fell in other parts of the world and also were regarded as holy objects. However, the oldest known meteorite whose fall is actually recorded, dates from 1492, so that year has something else to be famous for. Also, in ancient or medieval times, there were at least several dozen descriptions of meteor showers when the entire sky seemed to be covered with shooting stars, like ribs of a gigantic umbrella.

"At present," said Prof. Olivier, "one thousand meteorites are represented in various museums."

The meteorites are of two kinds. One consists largely of nickel and iron like the Ahnighito. As in the case of Peary's discovery of this one, many of these were found long after they fell and were identified by their composition. The other meteorites consist of stone. As they look like common rocks, and soon disintegrate in our damp atmosphere, they can only be identified when they are actually seen to drop from the sky.

"Our very term 'meteorology' proves that for a long time they were considered to be merely atmospheric phenomena, like the aurora, lightning, etc.," said Prof. Olivier. "As for meteorites, scientists during the eighteenth century ridiculed the fact that a stone could fall from the sky, and branded as ignorant dupes or deliberate liars every one who reported such occurrences."

"Their argument was simplicity itself: Stones could not fall from the sky, therefore they did not. Who could ask for more? But, despite the dictum of the greatest scientists (and this included every branch of natural science as well as astronomers) stones kept on falling. In 1803 Biot was finally delegated by the French Academy to investigate the fall of l'Aigle in France, and his report carried conviction to the most opinionated of his colleagues. From that day on, meteorites took their place as respectable, if minor, members of the solar system."

It was on November 13, 1833, that one of the greatest of meteor showers appeared. At this time all the meteors seemed to radiate from a point in the constellation of Leo, the lion. Every year, in November, meteors appear that seem to emerge from the same point, known as the radiant. The meteors of this group, because of this, are known as the Leonids.

It was the 1833 shower, said Prof. Olivier, that forced the attention of the scientific world to the fact that meteors constituted a neglected field of astronomy waiting for investigation. One result was the finding that previous showers had occurred at approximately thirty-three-year intervals, and so it was predicted that another large shower would happen on November 13 or 14, 1866. The shower occurred as predicted.

About 1899, it was expected again, and while nothing as brilliant as in 1833 or 1866 appeared, there were unusually large numbers of meteors, even for November, in 1900 and 1901. Perhaps 1933 will bring another unusually great return of them.

Several of these showers were shown to be connected with comets. The Perseid meteors, which seem to radiate from a point in the constellation of Perseus, every August, were shown to follow the same orbit as Tuttle's Comet. The November Leonid meteors were shown to follow exactly the same path as Tempel's

Comet. In November, 1872, another shower appeared which came from the direction of the orbit of Biela's comet. These came again in 1885, in 1892, and as a small one in 1899. Since then they have not been seen with the exception of a single observation last year made through a telescope by an amateur at Swarthmore, Pa.

This shows some connection between meteors and comets. According to Prof. Olivier, the nucleus of a comet is not a solid mass but a multitude of small solid pieces of varying size. On each visit to the sun, a comet loses part of its material. It is probably from the pieces constituting the nucleus that comets form meteors. The small compact mass of meteors that dug out the meteor crater in Arizona must have really been the nucleus of a small comet. Just when this happened we cannot tell, although Prof. Olivier believes it to have been certainly within the last five thousand years, and probably within the last two thousand.

Probably the Siberian meteorite of 1908 was also connected with a comet. It was in the following year that the Pons-Winnecke Comet came close to the sun. In 1916 a number of meteors were seen in May and June, which Prof. Olivier identified as following the same orbit as this comet and so proving that it was already disintegrating.

So perhaps comets are being formed in distant solar systems. Perhaps along with them the tiny planets and the meteorites are also being created. And perhaps occasionally one of these meteorites and, once in a while, a comet, parts company from its system and travels across the gap to our own part of the universe. To us they signify their origin.

"Just as the brickbats, pieces of stone, scraps of metal and wood chips that lie around a newly completed house would give us some idea of how the building was erected, so meteors and meteorites can give us similar information as to the evolution of the solar system," said Prof. Olivier "and by the same token they give us information as to the other solar systems."

Science News-Letter, July 20, 1929

To avoid disputes as to authorship of their paintings, artists in France are having their pictures registered, and filing data sufficient to establish identity of the pictures.

TUNE IN

on Science Service's Radio Talks

Every week a radio talk on science, prepared by Science Service, is given from each of the stations listed below at the times mentioned. Times are in standard time of the locality.

KFMX	NORTHFIELD, MINN.; Carleton College; 1250 kc., 1000 watts. Monday, 11:00 to 11:15 a. m.
KFRU	COLUMBIA, MO.; Stephens College; 630 kc., 500 watts. Tuesday, 5:00 to 5:15 p. m.
KGBU	KETCHIKAN, ALASKA; Alaska Radio and Service Co.; 900 kc., 500 watts. Wednesday or Friday, 7:00 to 7:15 p. m.
KGU	HONOLULU, T. H.; The Honolulu Advertiser; 940 kc., 500 watts. Irregular times.
KGW	PORTLAND, OREGON; The Portland Oregonian; 610 kc., 1000 watts. Sunday, 5:00 to 5:15 p. m.
KOAC	CORVALLIS, OREGON; Oregon State Agricultural College; 560 kc., 1000 watts. Friday, 7:30 to 7:45 p. m.
KUOA	FAYETTEVILLE, ARKANSAS; Roy E. Burton; 1390 kc., 1000 watts. Monday, 8:30 to 8:45 p. m.
KVOO	TULSA, OKLA.; Southwestern Sales Corporation; 1140 kc., 5000 watts. Monday, Tuesday or Thursday, between 12:45 p. m. and 1:30 p. m.
WCAD	CANTON, N. Y.; St. Lawrence University; 1220 kc., 500 watts. Tuesday, 12:30 to 12:45 p. m.
WCAJ	LINCOLN, NEBRASKA; Nebraska Wesleyan University; 590 kc., 500 watts. Friday, 4:30 to 4:45 p. m.
WDAE	TAMPA, FLORIDA; Tampa Daily News; 620 kc., 1000 watts. Irregular times.
WEAO	COLUMBUS, OHIO; Ohio State University; 550 kc., 750 watts. Friday, 12:50 to 1:05 p. m.
WGBF	EVANSVILLE, INDIANA; Evansville on the Air, Inc.; 630 kc., 500 watts. Sunday, 5:30 to 5:45 p. m.
WGR	BUFFALO, N. Y.; W G R, Inc.; 550 kc., 1000 watts. Thursday, 6:15 to 6:30 p. m.
WHAS	LOUISVILLE, KENTUCKY; Courier-Journal and Louisville Times; 820 kc., 6,500 watts. Tuesday, 10:00 to 10:15 a. m.
WHAZ	TROY, N. Y.; Rensselaer Polytechnic Institute; 1300 kc., 500 watts. Monday, between 9:00 and 11:00 p. m.
WHBY	WEST DE PERE, WISCONSIN; St. Norbert College; 1200 kc., 100 watts. Friday, 7:30 to 7:45 p. m.
WHO	DES MOINES, IOWA; Bankers Life Co.; 1000 kc., 5000 watts. Tuesday, 11:45 a. m. to 12:00 m.
WMAL	WASHINGTON, D. C.; M. A. Leese Radio Co.; 630 kc., 250 watts. Thursday, 7:15 to 7:30 p. m.
WMAQ	CHICAGO, ILLINOIS; Chicago Daily News; 670 kc., 5000 watts. Saturday noon or Thursday afternoon.
WSM	NASHVILLE, TENNESSEE; National Life and Accident Insurance Co.; 650 kc., 5000 watts. Wednesday, 5:45 to 6:00 p. m.
WWVA	WHEELING, WEST VIRGINIA; West Virginia Broadcasting Corp.; 1160 kc., 250 watts. Thursday, 6:00 to 6:15 p. m.

If none of these stations are within reach of your radio set, write to the Program Director of your favorite radio station, suggesting that he add Science Service's radio talks on "Science News of the Week" to his schedule. Full information from

SCIENCE SERVICE

2101 B Street

Washington, D. C.

Experiments in Evolution

Biology
E. C. WILM, in *The Theories of Instinct* (Yale Univ. Press):

I cite, in conclusion, some experiments reported by two eminent biologists, the Swiss Pictet, and the Frenchman Marchal, which clearly point to the inheritance of acquired functions. Other instances are reported here and there, and a number of investigations are now in progress, the results of which are not yet fully available. The following cases have to do with inherited modifications of the nutritive instinct.

Pictet fed to caterpillars of different species food other than that on which they normally subsist. In the case of several night-flying moths the taste for the new diet was transmitted by heredity, individuals whose parents had come to tolerate the unaccustomed diet eating it with much greater readiness. The caterpillars of the gypsy moth, which live normally on the leaves of oaks and birches, were fed on walnut leaves, which they ate under protest. The moths which issued from this rearing were less highly colored and smaller; but the fourth generation had become accustomed to the diet, and had resumed the size of the insects living on a normal diet.

Marchal's experiment consisted in forcing the scale insect of the peach (*Lacanium corni*) to live on honeylocust, and certain of the larvae adapted themselves to this food. The following year the insects reproduced upon the locust, and their young had become so thoroughly adapted to their new host that it proved impossible to rear to sexual maturity those which had been transplanted again to their original host, the peach.

A well-known example of the apparent heredity of acquired habit is the mulberry silk worm, cited by Darwin, which has, in its evolution from a wild to a domesticated state, gradually adapted itself to conditions which would earlier have been fatal to it.

Science News-Letter, July 20, 1929

The Chinese peanut crop traces its history back to four quarts of American peanuts carried to China 35 years ago by a missionary.

One-half of the men and one-fourth of the women in colleges and universities in this country work while gaining their education.

Kerosene is used as fuel for more than 80 per cent. of the tractors in South Africa.

Physician Investigates "Blindfold" Test

Medicine

The ease with which college students and other types of American smokers are reported to distinguish between cigaret brands is questioned by Dr. Emil Bogen of Cincinnati. Dr. Bogen told members of the American Medical Association that he gave the now famous "blindfold" test to a mixed group of professional men, university students and laborers, all of whom had been smoking more than three years and used an average of one package of cigalets a day. He found that they could not tell one brand from another, but that they could distinguish between West Indian and Oriental cigalets and between these and the blends and pure domestic brands.

One smoker who recognized the

class consistently was also able to distinguish the brands in some cases, but Dr. Bogen said that he was an exceptional smoker.

Dr. Bogen also investigated various other advertised advantages of different brands of cigalets. He found that one brand advertised widely as toasted had a relatively high percentage of moisture. The moisture content of the cigaret varies with the humidity of the surrounding atmosphere and may be from 8 to 50 per cent. of the weight of the tobacco.

The highest nicotine content was found in domestic cigalets, the lowest in the West Indian brands. Nicotine was not the only injurious agent found in cigaret smoke. Ammonia, carbon monoxide, the heat of the

smoke, and irritating tarry substances are present in quantities sufficient to cause local irritation of the nose, throat and eyes, Dr. Bogen observed.

"Coolness" of the smoke seems to depend more on the rate of smoking than on the brand of cigaret. Different cigalets have the same range of temperature when smoked at the same rate. The temperature of the smoke after passing through the unburned tobacco in half the length of the cigaret is never greater than that of the human body, which is normally 98.8 degrees Fahrenheit. However, when only a quarter of the cigaret is left the smoke may be so hot as to injure the tissues of the mouth and throat.

Science News-Letter, July 20, 1929

Medical Advances Shown

Medicine

Medicine's advances during the past year were graphically portrayed in exhibits before the American Medical Association's annual meeting at Portland, Oregon, last week.

The conquest of anemia by feeding liver extracts, new ways of feeding babies, additional hopeful reports of hitherto hopeless paresis being subdued by malarial fever, the rise of hydrogen sulphide gas as an industrial menace, a newer, speedier way of diagnosing cancer—these and many other achievements were shown.

Hydrogen sulphide, familiar to the practical joker of school chemistry classes as the gas with the rotten-egg odor, is causing concern and developing into a menace to life due to the greatly increased production of high sulphur crude petroleum. When the sulphur is taken out of the crude oil it is sometimes allowed to escape as hydrogen sulphide, which is poisonous in addition to its bad smell. Deaths have been caused in this way and the U. S. Bureau of Mines in its exhibit is warning physicians of this new danger to human life.

Babies do not get enough vitamin B, Dr. Roger H. Dennett, of the New York Post-Graduate Medical School and Hospital, has found. Wheat germ sugar added to the usual infant diet supplies this lack.

When the unruly growths or diseased organs are removed surgically from the body, surgeons are always desirous of knowing whether they show cancerous traits likely to spread

to other parts of the body. So Dr. Benjamin T. Terry of Rochester, Minn., has developed a special microscopical examination for speedy determination of malignancy which he taught to physicians at the meeting.

Eating liver has been proved to be an effective way of renewing the red blood cells that are depleted by anemia and now several commercial laboratories are supplying concentrated liver extract so that the patients will not be forced to eat large quantities of liver for their health's sake.

Sieved baby food already canned and prepared to save mother the trouble and orange juice bottled without preservatives, artificial color, or dilution were other new food preparations shown.

For the physician who wishes to travel light but prepared there is an emergency hypodermic kit no larger than a fountain pen. The progressive surgeon can now have chromium finished instruments. And a recent drug useful in treating colds because it dries up the nose and throat is ephedrine. For the remedy of erysipelas there has been devised an antitoxin that is now commercially available.

Such are a few of the new tools and materials given the practicing physician by cooperating colleagues and aids.

Science News-Letter, July 20, 1929

Paper board made from wheat straw is said to be highly resistant to fire.

New X-Ray Menace

Physiology

X-ray therapy, one of the blessings of modern science, can, in exceptional cases, produce feeble-mindedness and deformity in human beings. This possibility has been discovered through investigations by Dr. Douglas P. Murphy of the University of Pennsylvania. He emphasizes, however, that the danger is limited to treatment with X-rays, which does not include the taking of an ordinary X-ray picture.

Mothers shortly before the birth of their children are sometimes treated with X-ray irradiation for malignant growths. If the growing child is subjected to the irradiation from the X-ray machine at the same time that the therapeutic measures are undertaken, it has been determined that there is about one out of three chances that it will be feeble-minded. Malformations of the head and dwarfing of the limbs may occur under such conditions. Dr. Murphy has studied over a hundred instances of X-ray treatments under such conditions and he found that serious results had followed in one-third of the cases.

There is no danger in an ordinary X-ray picture if it is taken of the mother before the birth of her child. Neither has Dr. Murphy been able to discover any injurious effects upon subsequent children from X-ray treatments that were given before pregnancy.

Science News-Letter, July 20, 1929

Dried Fruits Prevent Scurvy

Physiology

Dried fruits which have been treated with sulphur dioxide gas maintain their vitamin C content, and therefore their ability to prevent scurvy, according to a study to be reported in the *Journal of Biological Chemistry*, by Agnes Fay Morgan and Anna Field of the University of California, Berkeley. The same fruits dried and not subjected to the sulphur dioxide treatment lose their vitamin value.

Fruits and vegetables are known to contain vitamin C, and it has been considered that these foods must be fresh when used to prevent scurvy. Since the danger of scurvy is greatest under circumstances where an adequate supply of fresh vegetables and fruits is most difficult to obtain, much interest has been shown in the effect of methods of preservation upon the vitamin C content of foods. Numerous studies have been made upon citrus fruit juices, cabbage, milk, potatoes and tomatoes.

Apparently the more acid foods, such as citrus fruits and tomatoes, are

not only more richly endowed with vitamin C, but are also better able to resist destruction of this vitamin by drying or processing.

Because of the inconsistency in previously reported work by other experimenters, and because of the economic importance of the commonly used dried fruits, the experimenters used peaches as the basis for their work.

Fresh, completely ripe peaches were used. They were picked, pitted, and ground in a food chopper. Some of the batch was sun-dried and some dried in dehydrators. Part of the dried batch was submitted to the action of sulphur dioxide over night. Then feeding experiments were made, using guinea pigs. It was found that the sulphured fruit retains the full vitamin C content of the fresh fruit, but the unsulphured dry fruit retained no detectable amount of this vitamin. The sulphured, dried peaches were found to rank with orange juice, raw tomatoes, and other highly potent anti-scorbutic foods.

Science News-Letter, July 20, 1929

Glands and Reproduction

Medicine

The endocrine glands of the body have almost all some part to play in the process of reproduction, it appears from studies made by Dr. Oscar Riddle of the Carnegie Institution.

"It appears that nearly all of the internal secretions are intimately concerned in one or another special aspect of reproduction," stated Dr. Riddle. "The facts now known indicate that the essential aspects of the mechanism of reproduction are not under the control of the nerves."

Dr. Riddle and his associates have found that certain seasonal changes in size and functional activity of some glands correspond with the period of greatest activity in the reproductive organs. Dr. Riddle has concluded from his studies that true hormones are meant primarily to regulate the activities and coordinations which are part of certain essential rhythms of the body, among them the species-preserving rhythms of reproduction.

Science News-Letter, July 20, 1929

Malaria Treatment

Medicine

The new malaria treatment of general paralysis has been successful in arresting the disease in 38 out of 100 patients so treated, Dr. Paul O'Leary of Rochester, Minn., reported to the American Medical Association. Observation of the group of 100 patients extended over five years. The 38 patients in whom the disease is arrested have been restored to economic efficiency to the extent of supporting themselves and their families.

The outcome of general paralysis or paresis, the end-results of syphilis, has heretofore invariably been fatal, death coming after a long period of both mental and physical disability and suffering. The important feature of the results reported by Dr. O'Leary is that regardless of the prolongation of life, the 38 patients in whom the disease is arrested are able to resume their normal activities, instead of languishing in some hospital or institution, a continual and increasing burden to themselves and their families.

Besides the 38 arrested cases, 31 patients now show improvement. Seventeen have not benefited and 14 are dead. Of these 14, only 5 died of malaria, the other deaths being due to the paresis, to accident, suicide and various diseases.

Science News-Letter, July 20, 1929

Mental Hygiene Proves its Value

Medicine

Mental hygiene is proving its worth in many fields, among them education, jurisprudence, and philanthropy. Members of the American Medical Association attending a symposium on the subject heard that it can prevent the development of mental defectives and diminish the number of maladapted children, and that psychiatry, of which mental hygiene is a branch, is becoming increasingly useful in the handling of criminals.

Mental hygiene is concerned with the prevention of mental deficiency and insanity. It is a sort of social prophylaxis, explained Dr. Ira Wile of New York City. It is of greatest usefulness in childhood, while adjustments and adaptations of personality are still going on.

Emotional maladjustments, sex difficulties, actual mental and nervous illness and various types of disciplinary problems are the chief difficulties of college students that are being satisfactorily dealt with by mental programs and psychiatric departments in the various schools and colleges, Dr. Winifred Richmond of Washington, D. C., said. Dartmouth, Vassar and California were among the pioneers in this movement. During the five years since the work began at Vassar

185 girls and 6 teachers have been referred to the psychiatrist. More than 20 schools and colleges were represented at a conference on mental hygiene in schools and colleges held in Boston recently.

While psychiatry in criminal proceedings has gotten a bad name for itself, the system now in use in Massachusetts has proved the real worth of this science when properly applied in dealing with criminals. Dr. Winfred Overholser of the Massachusetts Department of Mental Diseases explained that in his state all persons indicted for capital offenses or bound over for a felony, having been previously convicted of a felony or indicted for any other offense more than once, are examined in the state department of mental diseases. The examination is entirely routine. As a result no defendant is put on trial who is mentally unfit and the "battle of experts" which has disgusted and disturbed the public elsewhere has practically disappeared in the state.

Science News-Letter, July 20, 1929

Among the crystals in the Field Museum collection is a perfectly formed prism of blue beryl weighing 26 pounds.

CLASSICS OF SCIENCE:

Measles in the Year 1670

Medicine

The exact observation and description of symptoms mark Sydenham as one of the pioneers of modern medicine. The treatment prescribed, too, with its insistence upon "an attempted regimen" shows that the ancient superstitions, such as blood-letting, were beginning to be modified by modern common sense.

THE WORKS OF THOMAS SYDENHAM, M. D., translated from the Latin edition of Dr. Greenhill with a life of the author by R. G. Latham, M. D. In two volumes. Printed for the Sydenham Society, London, MDCCCXLVIII (1848).

The Disease

1. The measles set in early as usual; i. e., at the beginning of January. They gained strength every day, until they reached their height, about the vernal equinox. After this they gradually decreased at the same rate; and by the month of July were wholly gone. As far as I have hitherto seen, I believe these measles to be the most perfect disease of their genus, for which reason I shall record their history with all the care and minuteness that the observations which I then made will warrant.

2. This disease begins and ends within the above-named period. It generally attacks infants, and, with them, runs through the whole family. It begins with shiverings and shakings, and with an inequality of heat and cold, which, during the first day, mutually succeed each other. By the second day, this has terminated in a genuine fever, accompanied with general disorder, thirst, want of appetite, white (but not dry) tongue, slight cough, heaviness of the head and eyes, and continued drowsiness. Generally there is a weeping from the eyes and nostrils, and this epiphora passes for one of the surest signs of the accession of the complaint. But to this may be added another sign equally sure, viz., the character of the eruption. Although measles usually shows itself by an exanthema upon the face, there appears upon the breast a second sort of breaking-out. This consists in broad red patches on a level with the skin, rather than true exanthemata. The patient sneezes as if from cold, his eyelids (a little before the eruption) become puffy; sometimes he vomits; oftener he has a looseness; the stools being greenish. This last symptom is commonest with infants teething, who also are more cross than usual. The symptoms increase till the fourth day. At that period (although sometimes a



THOMAS SYDENHAM

day later) little red spots, just like flea-bites, begin to come out on the forehead and the rest of the face. These increase both in size and number, group themselves in clusters, and mark the face with largish red spots of different figures. These red spots are formed by small red papulæ, thick set, and just raised above the level of the skin. The fact that they really protrude, can scarcely be determined by the eye. In can, however, be ascertained by feeling the surface with the fingers. From the face—where they first appear—these spots spread downwards to the breast and belly; afterwards to the thighs and legs. Upon all these parts, however, they appear as red marks only. There is no sensible protuberance by which they show themselves above the level of the skin.

3. In measles, the eruption has not the same effect in allaying the previous symptoms as it has in smallpox. The cough and fever still continue, so does the difficulty of breathing. The defluxion and the weakness still remain in the eyes. The continued drowsiness and want of appetite all keep on as before. The continuance, however, of the vomiting I have never yet observed. On the sixth day—there or thereabouts—the forehead and face grow rough, the cuticle being broken, and the pustules dying off. At the same time, the spots upon the rest of the body attain their greatest breadth and redness. By the eighth day the spots have disappeared from the face, and show but faintly elsewhere. On the ninth day there are no spots anywhere. In place thereof, the face,

trunk, and limbs are all covered with particles of loosened cuticle, so that they look as if they had been powdered over with flour, since the particles of broken cuticle are slightly raised, scarcely hold together, and, as the disease goes off, peel off in small particles and fall from the whole of the body in the form of scales.

4. The measles most usually disappear about the eighth day, at which time, the vulgar (deceived by their reckoning in cases of smallpox) insist that they have *struck in*. In reality, however, they have finished their course. Thus it is believed that those symptoms which come on as the measles go off, are occasioned by their being struck in too soon; for it must be noted, that just at the time in question, the fever and the difficulty in breathing increase, and the cough becomes so harassing that the patient can sleep neither night nor day. Infants, especially when they have been subjected to the hot regimen, and patients generally who have had recourse to hot remedies for the sake of promoting the eruption, are liable to these symptoms—symptoms which show themselves just as the measles give way. Hence, they may be thrown into a peripneumony, and this kills more patients than either the smallpox itself or any symptom connected therewith. Yet, provided that the measles are properly treated, they are free from danger. A diarrhoea is a frequent symptom. This may succeed the disease, and run on for weeks, after every other symptom has departed; and it is of great danger to the patient, from the loss of spirits referable to the profuseness of the evacuation. Sometimes, too, after the more intense kinds of the hot regimen, the eruption grows first livid, and afterwards black. This happens to adults only; and when it *does* happen, all is over with the patient unless, immediately upon the blackness, he be assisted by means of bloodletting and the cooling effects of a more temperate method.

The Treatment

5. The treatment of measles, like their nature, is nearly the treatment of smallpox. Hot medicines and the hot regimen are full of danger, however much they may be used by ignorant old women, with the intention of removing the dis- (Turn to next page)

Sydenham on Measles—Continued

ease as far as possible from the heart. This method, above others, has been most successful with me. The patient is kept to his bed for no more than two or three days after the measles have come out. In this way the blood may gently, and in its own way, breathe out, through the pores of the skin, those inflamed particles which are easily separable, but which offend it. He has, therefore, neither more blankets nor more fire than he would if well. All meats I forbid; but I allow oatmeal-gruel, and barley-broth, and the like; sometimes a roasted apple. His drink is either small beer, or milk boiled with three parts of water. I often ease the cough, which is constant in this disease, with a pectoral decoction, taken now and then, or with linctus, given with the same view. Above everything else, I take care to give diacodium every night throughout the disease.

Take of Pectoral decoction, $\frac{1}{2}$ lb.

Syrup of violets,

Syrup of maidenhair, each $1\frac{1}{2}$ fl. oz.

Mix, and make into an apozem. Take three or four ounces three or four times a day.

Take of Oil of sweet almonds, 2 fl. oz.

Syrup of violets,

Syrup of maidenhair, each 1 fl. oz.

White sugar-candy, sufficient quantity.

Mix and make into a linctus. To be taken frequently; especially when the cough is distressing.

Take of Black-cherry-water, 3 fl. oz.

Syrup of white poppy, 1 fl. oz.

Mix, and make into a draught; to be taken every night.

If the patient be an infant, the dose of the pectoral and anodyne must be lessened according to age.

6. He that uses this remedy rarely dies; nor, with the exception of the necessary and inevitable symptoms of the disease, is he afflicted with any superadded disorders. It is the cough which is the most distressing. However, it is not dangerous, unless it continue after the disease is gone. And even then, if it last a week or a fortnight, by the use of fresh air, and the proper pectoral remedies, it is got rid of with no great difficulty. Nay, it may go off of its own accord.

7. But if, however, the patient, from the use of cordials or from a hot regimen, be in a condition which is by no means unfrequent after the departure of the measles; i. e., if his life be endangered from the violence of a fever, from difficulty of breathing, or from any other symptom of a peripneumony, I take blood from the

arm, and I do it with remarkable success. The bleeding is proportionate to the age; but it can be applied even to infants. At times I have even repeated it. Under Divine Providence, I have saved many infants in this way, and I know of no other. The symptoms themselves occur with infants at the recession of the eruption; and they are so fatal, that they do more to fill Charon's boat than the smallpox itself. Further—the diarrhoea, which has been stated to follow the measles, is equally cured by bloodletting. It arises (as in pleurisies, peripneumonies and other inflammatory diseases) from the vapours of inflamed blood rushing upon the bowels, and so forcing them to the secretion. Nothing but venesection allays this. It makes a revulsion of the sharp humours, and reduces the blood to its proper temperature.

8. Let no one wonder that I recommend bleeding with tender infants. As far as I have observed, it is as safe with them as with adults. Indeed, so necessary is it in some cases that, in respect to these particular symptoms, and in respect to some others as well, infants cannot be cured without it. For instance, how could we ease the convulsions of the teething-time of infants—which take place about the ninth or tenth month, and are accompanied with pain and swelling of the gums, compression and irritation of the nerves, and paroxysms that arise therefrom—without venesection? In such cases it is better by far than all the most vaunted specifics; be they what they may. Some of these, indeed, add to heat, and do mischief; and, however much they may have the credit of arresting the disorder by means of some occult property, frequently kill the little sufferer. At present, too, I say nothing about the immense relief afforded in the *pertussis*—or the whooping-cough—of infants by venesection. Here it leaves far behind it all pectoral remedies whatsoever.

9. What has been said concerning the cure of those symptoms which occur during the going-off of measles, occasionally applies to the treatment of them at their height. It does so when they are occasioned by an adscititious and artificial heat. In 1670, I was called in to see a maid servant of the Lady Anne Barrington's, suffering under this disease, together with a fever and difficulty of breath-

ing, with purple spots discolouring the whole of her body, and with other symptoms of the most dangerous kind. I put down all this to the hot regimen, and the abundant hot medicines which she had used; and so I bled her at the arm, and ordered a cooling pectoral ptisan to be taken frequently. By the help of this, and by a more attempered regimen, the purple spots and the other bad symptoms gradually disappeared.

10. This disease, as stated above, began in the month of January, and increased every day until the vernal equinox. From that time forwards it decreased, and wholly disappeared in July. With the exception of a few places, where it showed itself in the following spring, it never returned during any of the years in which the present constitution prevailed. So much for the measles.

Thomas Sydenham (1624-1689) is noted for his studies of the "constitutions" or types of small pox, gout, various fevers and other common diseases. His treatment of them was directed so largely to making the patient comfortable that he was looked upon as something of a faddist by other physicians of his day. Sydenham left Oxford at 24, with a degree of Bachelor of Medicine, served in the army of Parliament for a time, and then obtained a license to practice his profession, but waited until his oldest son was attending Cambridge University to take his doctor's degree from that institution. The latter part of his life, after 40, he devoted to writing up his theories of the practice of medicine, and his observations of disease.

Science News-Letter, July 20, 1929

Blueberries' Breath

Botany

The younger members of the human species are not alone in breathing faster when they blush. The humble blueberry also experiences more rapid respiration when the color comes to its cheeks, according to Dr. H. F. Bergman of the U. S. Department of Agriculture, who reports his investigations in *Science*.

Dr. Bergman found that the berries he was watching produced most carbon dioxide, the by-product gas of respiration, when they were deepening from pink to red. By the time they had become blue-ripe—blue in the face, so to speak—the carbon dioxide production fell off materially. The study of the breathing rate of fruits is of importance in determining their keeping qualities, and Dr. Bergman is continuing his researches on the blueberries.

Science News-Letter, July 20, 1929

Geological School in England

Geology

Ten geologists have just reached Liverpool to inaugurate the first International Summer School of Geology and Natural Resources under the auspices of Princeton University.

For two months the party, traveling by automobile, will visit and study the principal geological formations of England, Scotland and Wales.

The American party will be the guests of the British geologists, and the trip will be run by Prof. Owen Thomas Jones, F. R. S., head of the department of geology, University of Manchester, and E. B. Bailey, F. G. S., of the Geological Survey of Scotland. A number of other British geologists will act as guides in special localities. The excursion is being run as a demonstration of the fundamental problems in British geology and their relation to national resources.

The party includes: Dr. E. O. Ulrich, U. S. Geological Survey, senior

paleontologist, National Museum, specialist in stratigraphy of the Lower Paleozoic; Dr. T. L. Tanton, Geological Survey of Canada, specialist in Pre-Cambrian geology; Prof. R. M. Field, Department of Geology, Princeton University, director of the International Summer School of Geology and Natural Resources, specialist in paleoceanography and sedimentation; Prof. C. E. Gordon, head of the department of geology, Massachusetts Agricultural College; Prof. T. H. Clark, department of geology, McGill University, Lower Paleozoic Stratigraphy; L. L. Lee, State of New Jersey Agricultural Experiment Station; Henry Jeffers, Walker-Gordon Company, specialist in grassland management; R. F. Norris, Princeton '28; J. S. Vhay, Princeton '29; W. J. Newell, Princeton '29.

Science News-Letter, July 20, 1929

Dr. Theobald Smith Reaches 70

Animal Pathology

One of America's pioneer scientists, Dr. Theobald Smith, will celebrate his seventieth birthday on the last day of July. He has just retired from the directorship of the department of animal pathology of the Rockefeller Institute for Medical Research, but this great scientist, who showed the world a new way to wipe out disease, who conquered Texas fever and who demonstrated the difference between human and bovine tuberculosis, expects to continue his scientific work at the institute's laboratories.

Dr. Smith's epochal discovery, in 1893, that Texas fever of cattle was transmitted from one animal to another by ticks, was a far-reaching contribution to scientific advancement. It opened an entirely new field of medical research and a new line of attack on disease. The knowledge that an insect plays the important role of transmitting disease germs from one animal to another, and that part of the germ's life cycle is spent in the body of the insect, led to discovery of the role played by the mosquito in yellow fever and malaria and by the tsetse fly in African sleeping sickness.

It was Dr. Smith who discovered the cause of tuberculosis in cows, known as bovine tuberculosis, and he was the first to distinguish the bacillus from that causing the disease in

human beings. That was at the close of the last century. A quarter of a century later he studied and reported on the relation of bovine infectious abortion to Malta fever. This disease, or a variant of it in this country known as undulant fever, it causing concern among physicians and public health officials at present.

Other scientific work of Dr. Smith's was done on such vitally significant subjects as toxin-antitoxin mixtures in diphtheria, milk-borne epidemics of human streptococcus infection, and the protective value of colostrum, the first secretion of mother's milk after the birth of the infant.

"He was the first and remains the captain of American microbe hunters," wrote Paul de Kruif. "He showed men an entirely new and fantastic way a disease may be carried—by an insect. Wipe out that insect, dip all of your cattle in fields where there are no ticks, and Texas fever will disappear from the earth. Today whole states are dipping their cattle and today Texas fever which once threatened the great myriads of American cattle is no longer a matter of concern."

Science News-Letter, July 20, 1929

Egyptian mummies show that gallstones are one of the old ailments of mankind.

NATURE RAMBLINGS

By FRANK THONE



Plant Oaks

Midsummer days make us thank God for thinking of trees, and also thank such men as are forethoughtful enough to plant young trees along streets and in parks, where they will be our shield when we flee from the over-ardent sun.

As we Americans come more and more to build for permanence we should plan our street and landscape plantings for permanence also. The poplars and soft maples of pioneer settlements and hasty real-estate "improvements" must give way to trees that are longer-lived, even if slower-growing. Hard maples and elms are having their day, and it is the turn of the oaks as well.

In the South, of course, the beauty and utility of the live-oak has always been appreciated. Trees planted long "before the War" line the streets of many cities and towns below the Mason and Dixon line, venerable giants in size, but still youthful in vigor.

In the North, perhaps the favorite has been the white oak. It is of rather slow growth, but develops the very finest of timber, is strong, long-lived, and of beautifully symmetrical habit when growing in the open. Its sweet acorns, moreover, are great favorites with squirrels. A relative, the burr oak, does well in drier locations in the prairie states.

But the prize for suitability as a street tree among oaks must be awarded the pin oak. This belongs to the black-oak fraternity, but due partly to its odd habit of growing innumerable short twigs all over its trunk and then burying them in the growing wood, it builds up a complex-grained, tough-knit trunk, topped by a splendid symmetrical pyramid of a crown.

Science News-Letter, July 20, 1929

Jackrabbit Offers Fight to Six Men

Zoology

Yellowstone National Park offers the season's best rabbit yarn—incredible, yet solemnly attested to by six good men and true.

Park Ranger Fred T. Johnston tells it:

"It was late in June. Six of us were traveling in and on top of a truckload of beds and supplies, over a road evidently seldom used.

"During our journey we overtook a very young jackrabbit—in fact, one so young that it barely had its eyes open. He was exerting every effort, however, to scramble out of the rut he was in, but seeing that he was bound to fail, we stopped to assist him.

"Our intentions were undoubtedly misunderstood, because as soon as he was picked up he squealed as only a scared rabbit can squeal, but he ac-

complished his purpose. It's hard to believe that a rabbit would attack six men, but by the word of the six who were attacked, that's just what happened.

"The young rabbit 'knew his squealing' and so did his mother, or at least we gave the rabbit that came galloping out of the brush the credit of being his mother. And galloping is the word to express her progress in our direction on the second squeal from her complaining offspring.

"She appeared from a distance of a hundred yards or so away, and was standing in the center of a circular group we had formed before any of us could realize the truth of what we say. I was truly thankful that I was not the one who was holding the infant rabbit. There she stood among the aforesaid six of us, eyeing every-

one with bulging eyes that meant only one thing—rage. She was poised on her hind legs at the very feet of her infant's captor, apparently ready to spring at his face.

"Speech was impossible, and how long we stood there, dumbfounded, none of us attempted to say. I actually believe the young rabbit saved the situation, because his squealing stopped with the appearance of his mother, and she finally hopped off a short distance and waited. This act was not to be misunderstood, so the young rabbit was released immediately and left to the very capable and astonishing protection of his mother.

"To be attacked by a bear when molesting her young is natural, but a rabbit—well, even a bear seldom attacks six men."

Science News-Letter, July 20, 1929

A Shocking Omnibus

Physics

Prof. Charles Vernon Boys, eminent British physicist, was about to board an omnibus near his home on Victoria Street in London. As it came to a stop, he reached for the rail. When his hand came near the metal, he felt an unmistakable electric discharge from the rail to his hand, giving him a very noticeable shock.

Being a scientist, he did not pass it by as merely a curious happening. Instead he stopped to consider what the cause was. Also, as it was apparently a phenomenon that had never been observed before, he reported it to the scientific world through the pages of *Nature*.

"In all cases where the omnibus came along at a brisk pace and pulled up quickly I received a sharp prick from the spark," he said. "In one case a second application was rewarded by a second spark. It was at a time when the sun was shining down the street and all was as hot and dry as could well be. No doubt, it was the scuffling of the rubber tires on the polished asphalt that gave rise to the electrification. In intensity, the shock, if such a term can be used, was two or three times as strong as that obtained after stroking a cat by the fire on a frosty night, when a visible spark may be obtained from the cat's nose."

Science News-Letter, July 20, 1929

A large proportion of the lichens and mosses found in the Antarctic are also found in the Arctic.

Cancer Increase and Cosmic Rays

Speculative Physics

The cosmic rays, that continually bombard the earth from outer space, may now be much less intense than they were in past ages, and that may be the cause of the present world-wide increase in cancer.

This is the suggestion of a prominent Irish physicist, Dr. J. Joly, of Trinity College, Dublin, expressed in the British journal *Nature*. Dr. Joly admits that his ideas are "certainly at present purely speculative."

"There seems to be no sure ground for believing that the penetrating radiations are uniformly distributed throughout space," said Dr. Joly. "If they are not, and if considerable variations in the strength of those reaching the earth have occurred in the past—possibly referable to translatory movements of the solar system—then serious effects upon organic evolution may have taken place. Millikan estimates their present energy as equal to about one-tenth of that reaching the earth from the luminous radiation of the stars. At present, therefore, the penetrating rays are probably without positive effects upon organic life. It does not follow, however, that a recent decline in strength would be without serious effects."

Dr. Joly expressed the belief that the effect of such radiations such as penetrating rays and X-rays upon living tissue is due to the rays being absorbed and changed to beta rays, one of the three kinds of radiation

emitted from radium. Medical researches, he said, show that such rays have a selective influence. The same rays that destroy diseased tissue may actually have a healthful and stimulating effect upon neighboring health tissues. Thus, X-rays are used in the treatment of cancer.

As there has been a marked increase in cancer throughout the world in recent times, Dr. Joly suggested that it might be due to recent reduction in the intensity of cosmic rays, which formerly destroyed the cancerous tissue nearly as fast as it was formed.

Science News-Letter, July 20, 1929

Staff of Science Service—Director, Edwin E. Slosson; Managing Editor, Watson Davis; Staff Writers, Frank Thone, James Stokley, Emily O. Davis, Jane Stafford, Majorie Van de Water; Librarian, Minna Gill; Sales and Advertising Manager, Hallie Jenkins.

Board of Trustees of Science Service—Honorary President, William E. Ritter, University of California. Representing the American Association for the Advancement of Science, J. McKeen Cattell, President, Editor, Science, Garrison, N. Y.; D. T. MacDougal, Director, Desert Laboratory, Tucson, Ariz.; Dr. Raymond Pearl, Director, Institute for Biological Research, Johns Hopkins University, Baltimore, Md. Representing the National Academy of Sciences, John O. Merriam, President, Carnegie Institute of Washington; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, Calif.; Dr. David White, Senior Geologist, U. S. Geological Survey. Representing National Research Council, Vernon Kellogg, Vice-President and Chairman of Executive Committee, Permanent Secretary, National Research Council, Washington, D. C.; O. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry. Representing Journalistic Profession, John H. Finley, Associate Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City. Representing E. W. Scripps Estate, Harry L. Smithton, Treasurer, Cincinnati, Ohio; Robert P. Scripps, Scripps-Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

When Baby Walks

Psychology

The ages at which a child takes his first step and utters his first word have always been matters of supreme importance to mothers and grandmothers. Scientists have decided that they are important, too, and have found, just as any mother might have told them, that the bright child learns to talk and walk earlier than a child of lower intelligence. That this is true was proved by a statistical study reported to the American Medical Association by Dr. Isaac Abt, world-famous child specialist of Chicago.

Records of 500 boys and 500 girls who had been referred to the Chicago Institute for Juvenile Research for examination were studied. The girls began to talk at an average age of 18 months and the boys at 19 months. The average age for walking was 16 months.

Science News-Letter, July 20, 1929

"Age of Speed" Hearing Disorders

Otology

The stresses and strains of existence in this "Age of Speed" may have a considerable influence on the hearing of patients who come into an ear specialist's office. This point was brought to the attention of the American Federation of Organizations for the Hard of Hearing at its annual meeting by Dr. Frederick T. Hill, of Waterville, Maine.

The automobile, for instance, may serve to increase some cases of deafness if, through fast driving with windows open, the membrana tympani are subjected to too much wind, he stated. Habits and routine of life thus play a part in determining the patient's condition, and such apparently slight matters warrant consideration by the specialist.

Dr. Hill decried unnecessary and excessive use of surgery in treating deafness and urged that patients should be thoroughly studied, not by one specialist, but by "team work" of a group of specialists before a plan of treatment is outlined. The otologist, or ear specialist, should have the assistance of an internist to discover physical defects, a dentist, a clinical pathologist with laboratory facilities for serum examinations, and an X-ray specialist, he said. Metabolism studies should be available, since probably ten per cent. of these cases have endocrine gland disturbances, he added.

Meadow Mice Expensive Guests

Zoology

The meadow mouse looks soft and pretty and harmless, but he is a most expensive guest just the same. Vernon Bailey, of the U. S. Biological Survey, has been figuring his board bill, with rather startling results. A meadow mouse eats about 30 grams, or a little over an ounce, of green food every day. That runs up to 23 pounds in a year.

A hundred mice will stow away over a ton of green grass or clover in a twelvemonth. A hundred mice to an acre is not an unusual number in meadows favorable to their habits, while in "mouse years" the number has been estimated at thousands to the acre.

Mouse plagues, disastrous as they are locally, are of minor importance in comparison with the steady yearly drain on crops by the mice over the country at large in normal years.

Even as few as 10 meadow mice to the acre on 100 acres of meadow would take about 11 tons of grass or 5½ tons of hay a year. This number, on the 65,000,000 acres of hay raised in the 38 mouse states of the country, would cause a loss of over 3,000,000 tons of hay a year, or a money loss of some \$30,000,000 annually in hay alone.

The number of young in a litter ranges from two to nine, and one pair averages five to the litter. At this rate of increase, allowing equal numbers of males and females, and the young beginning to breed at 46 days old, the total increase from one pair, if all lived and bred, would be over 1,000,000 individuals at the end of a year. If all were confined to one acre of ground, this would mean over 20 mice to every square foot.

Science News-Letter, July 20, 1929

Right-Eyed Vision

Physiology

That most human beings are right-eyed has recently been demonstrated, but why a person sees better with one eye than the other is only now being ferreted out. Working under a grant from the Research Council of the American Medical Association, Paul E. Lineback has made microscopic studies of the central yellow-spot portion of the retinae of the two eyes of the same person or animal, with particular care in the measurement of the distance from the fovea or center of the yellow-spot of each eye to the outer edge of the optic disc.

He found that in every one of 18 pairs of human eyes the distance was shorter in the right eye than in the left. The differences are so slight that they must be measured in tenths of millimeters.

Mr. Lineback suggests that the right fovea being nearer its optic disc than the left would have some influence in bringing this eye more readily into the line of vision. Measurements on nine pairs of monkey eyes showed that eight of the pairs were like the human eyes so far as the retinal condition was concerned. But in the ninth monkey the reverse was true; that is, a shorter distance was measured between the fovea and the point of departure of the optic nerve in the left eye than was measured in the right eye.

Science News-Letter, July 20, 1929

Acid Best For Trees

Ecology

Acid soil has long been decried as bad farm land for so many years that it has come to be considered by current thought as no good for anything. It may, however, be as good for growing crops of wood as it is bad for growing crops of grain, according to results of experiments recently performed by Henry I. Baldwin of Berlin, N. H. Mr. Baldwin sprouted red spruce seeds in water of varying acidity and alkalinity. He found that slightly acid water was better than any of the alkaline waters. He got the best results in pure distilled water, which is perfectly neutral; but of course distilled water is never found under natural conditions.

Science News-Letter, July 20, 1929

The Inspiration of Science

General Science

NATHANIEL SCHMIDT in *World Unity*:

The advance of science has tended to make us more modest. Man obviously does not hold as significant a position in the universe as he once supposed. Though his knowledge grows from day to day and is capable, in a measure, of verification, it is fragmentary, relative, and subject to constant revision. Dogmatism is out of place, loud affirmation not permissible. The method of science, proceeding by induction and deduction, circumspectly, warily and tentatively, from the less to the more adequately known, is at once the most revolutionary element and the greatest agency for fostering humility

and modesty. The boundless space, the infinite stretches of time, the exhaustless energy, the orderliness of all the processes of nature, the unexplored beyond in every direction cannot fail to inspire a sense of awe and mystery and reverence. Science has engendered a new feeling of solidarity. Man is tied to the past and to the future, bound up with the whole scheme of things in a causal connection, and so are all the manifestations of his life. It is not possible for him to be alone. Yet in spite of his insignificance and close genetic connection with less developed forms of existence, so emphasized by science, it has also made him conscious of something

intrinsically great within himself, a capacity to peer into nature's workshop, to observe, compare, verify, conclude, generalize, aspire. This tends to give him a fresh sense of exaltation, zest for renewed effort, a joy unspeakable and full of glory. The wonders accomplished by the scientific technique, far more impressive than all the miracles he dreamed of in his youth, have revealed that there is in his nature a vast fund of creative ability. He can change his material and social environment; he can change himself; he can change the heredity and environment of posterity.

Science News-Letter, July 20, 1929

Our Artificial Environment

Sociology

JOHN HERMAN RANDAL, JR., in *Our Changing Civilization* (Stokes):

Science and technology have changed our life not only by giving it world-wide scope; they have created a new artificial environment, the mechanical city. Where modern cities arise using all our invented techniques, they induce the world over the same modes of life and the same breaks with the institutions and ideas of the past. The problems facing such traditional forms as the family and art and religion in the West are much like those they face in China or India or Angora; the contemporary tendencies in every industrial environment, so far as the observer can see, are the same. Man has built himself a new world to live in; and quite naturally though unintentionally he is forced to transform all his old ways to adapt himself to it. Everywhere the new environment has penetrated the old adjustment has been thrown out of balance. Everywhere men are groping toward the same mechanized and socialized life. Everywhere women are forsaking the home and undermining the old forms of marriage. Everywhere factory workers are facing the same problems of resistance and control.

Taking his clue from the discoveries of experimental biology, the psychologist has thrown a flood of light on the second great factor in culture building, the raw material furnished by human nature. He has come to look upon man as essentially a biological organism, a complex or-

ganization of living cells, whose functioning is loosely coordinated, chiefly by the nervous system. At birth infants are largely bundles of capacities and potentialities for the acquisition of an indefinite number of habits. As they grow they are naturally forced into the social pattern that prevails in their home. The Blackfoot Indian boy learns to ride and dance and hunt game, to accept the tribal arrangement of marriage and property, to perform the tribal crafts and have the tribal religious visions, to believe implicitly the tribal lore. The French boy learns to read and write, to be a professing Catholic, to believe in science and the French Revolution and French glory, to carry on the family, to acquire a mistress, the French lucidity of expression, and the Latin temperament. Exchange the two boys at birth, and the French baby would grow up a good Indian while the Indian became a perfect Parisian. All the elements we can distinguish in human nature—will, temperament, character, personality, conscience, mind, soul, intelligence—are to the psychologist not things that are possessed, but the complex organizations of human behavior, the acquired habits of responding to certain stimuli learned by contact with the group in which the man lives.

Such a way of looking at human nature does not reveal the value which men can give their lives by developing one moral character rather than another, or by acquiring a critical and imaginative habit of mind. But it

does make clear that whatever potentialities are brought by a child into the world are at every turn moulded, stunted or developed by the group culture that provides the channels through which they are organized. Had a Newton or a Darwin been born amidst the Eskimos, he might have grown up to invent a new method of hunting walrus or introduce a new plant as food. Had a St. Francis or a Savonarola appeared on the Congo he might have started a new society of religious dancers or led a crusade against the scorners of witch-doctors. Without the accumulated ideas of the scientific tradition, there could be no scientific genius; without the rich Christian past there could be no Christian humility or righteous wrath. The very type of character or mind that can appear in any group is determined by the cultural tradition that can alone develop it.

Science News-Letter, July 20, 1929

Modern Nursery Rhyme

Astronomy

Twinkle, twinkle, little star,
How I wonder where you are.
Up above the world you shine,
But according to Einstein
You are not where you pretend—
You are just around the bend,
And your sweet, seducing ray
Has been leading men astray
All these years. O little star,
Do you know how bad you are?
—Anon.

Science News-Letter, July 20, 1929

FIRST GLANCES AT NEW BOOKS

THE ORGANIZATION OF KNOWLEDGE—Henry Evelyn Bliss—*Henry Holt* (\$5). The present partition of the sciences is the accidental result of their historical development, like the prevailing boundaries of nations. We are then not violating any law of Nature when we adopt another system for the classification of natural phenomena, when we substitute a psychological for a chronological way of approach. Our blind following of the conventional and arbitrary separation of the sciences in the curriculum and library is the cause of constant confusion, so Mr. Bliss' effort to introduce a rational system is a timely movement. He compares and criticizes the various systems for the classification of human knowledge devised by Aristotle, Hobbes, Leibniz, Kant, Comte, Spencer, Münsterberg, and Ostwald. The question is not merely one of philosophical interest, but has a very practical bearing upon methods of education, the organization of scientific societies and congresses, and the classification of books in the library.

General Science
Science News-Letter, July 20, 1929

THE MANSIONS OF PHILOSOPHY—Will Durant—*Simon and Schuster* (\$5). Having shown himself remarkably successful in making clear the philosophy of others Will Durant has undertaken the same task for his own philosophy and with the same success. He discusses current problems of democracy, education, marriage, religion and esthetics with such frankness and tolerance that those who do not agree with his conclusions must concede his good intent and fairmindedness.

Philosophy
Science News-Letter, July 20, 1929

REPORT OF THE NATIONAL SCREW THREAD COMMISSION—U. S. Department of Commerce, Bureau of Standards—*Government Printing Office* (50c). In our civilization, so largely founded upon the machine, it is important that every nut fit the bolt. The standardization of screw threads of all sorts has been a major mechanical engineering activity and this report gives the history and specifications.

Engineering
Science News-Letter, July 20, 1929

PROVE IT YOURSELF—Bertha F. Gordon—*Owen* (\$1.50). This little book of "Experiments in Elementary Science" by a teacher in the public schools of Chicago contains many ingeniously devised experiments to lead boys and girls in their first steps in the field of science and in the acquiring an acquaintance of scientific methods by the only possible way—that is, by trying it out.

General Science
Science News-Letter, July 20, 1929

HAVE WE KEPT THE FAITH?—C. A. Prosser and C. R. Allen—*Century* (\$2.75). The authors show that more than 80 per cent. of the time of the typical high-school student is spent in the study of a foreign language, algebra and geometry, ancient or medieval history, classical English and a formalized presentation of one or more sciences. They contend that these studies are mostly the remnants of the old "aristo" education and do not equip our youth for service in modern society, nor for other supposed aims such as "the proper enjoyment of leisure" or "the more abundant life". Their idea of a democratic program of education, such as is now needed, is stated in these words:

1. It maintains and improves the physical condition of its people.
2. It maintains and improves the quality of the coming generation.
3. It promotes those skills and intelligence which conserve and utilize material resources.
4. It promotes the conservation of human resources.
5. It is universal in its contacts and service.
6. It trains people to think up to the limit of their thinking capacity.
7. It selects and trains capable leaders in all lines of endeavor.
8. It establishes and maintains among people a sane and intelligent view regarding national defense.
9. It trains in the fundamental arts of reading, writing, and figuring up to the necessary minimum which will enable a citizen to communicate with his fellows and to educate himself.
10. It gains these results by efficient procedures and, therefore, at a minimum social cost of time, effort and material.

Philosophy
Science News-Letter, July 20, 1929

A BRIEF COURSE IN CHEMISTRY—Lyman C. Newell—*Health* (\$1.48). A new and very attractive high school text on chemistry that should soon find a place in this already rather crowded field. The division of the book into two parts; the first containing the "minimum essentials" and the second "supplementary topics," makes it easy for the teacher to adapt the book to almost any kind of a course. In the first part are the fundamentals—elements, oxygen, carbon and its oxides, water, symbols and equations, etc., while the second part includes atomic theory, kinetic theory, Avogadro's law, periodic table, radioactivity, etc.

Chemistry
Science News-Letter, July 20, 1929

ARCHAEOLOGICAL INVESTIGATIONS IN KAMCHATKA—Waldemar Jochelson—*Carnegie Institution of Washington* (\$2.75). A report of the field work conducted in 1910-11 under the auspices of the Imperial Russian Geographical Society. Dr. Jochelson discusses the early contacts of white men in Kamchatka, new knowledge on the stone age culture of the region, and the transition into the age of metals.

Archaeology
Science News-Letter, July 20, 1929

PASTURES OF WONDER—Cassius Jackson Keyser—*Columbia University Press* (\$2.75). A mathematician looks at, discusses and philosophizes upon the relations between mathematics and science. He sees "mathematics as an edifice of hypotheticals, science as an edifice of categoricals." Pantheism is proposed as a suitable name to designate that enterprise which embraces both mathematics and science.

Philosophy
Science News-Letter, July 20, 1929

INVESTIGATION OF HEATING ROOMS WITH DIRECT STEAM RADIATORS EQUIPPED WITH ENCLOSURES AND SHIELDS (Bulletin No. 192)—Arthur C. Willard, Alonzo P. Kratz, Maurice K. Fahnestock and Seichi Konzo—*University of Illinois* (40c). Should steam radiators in our residences be adorned or left in their old-fashioned unhoused bareness? This research bulletin contains the answer.

Engineering
Science News-Letter, July 20, 1929

The Strength of a Gorilla

Zoology

GEORGE JENNISON, in *Noah's Cargo* (Macmillan):

Du Chaillu's *Adventures in Equatorial Africa*, 1861, is still the best account of the gorilla. Doubts have been expressed of his veracity, but points that can be checked have proved him correct. Its mode of fighting has been particularly criticized. In its habits the gorilla is very like a chimpanzee, and their manner of fighting is known; the writer once umpired a match between Consul and an Anubis baboon, in which the ape only used its open hand and the other bit. Similarly, when attacking a keeper, chimpanzees first poke with the open hand and retreat, only clasp and biting when this has been twice or thrice repeated. We may take it the gorilla does the same. He has no respect for Queensbury rules, and no man would stand up for the second round.

"Having eviscerated the hunter," Du Chaillu says, "it dented and bent his gun." Why not? It was only a common trade musket. The writer has seen a lion crumple up a bucket like tissue paper; the gorilla's teeth are bigger, his arms far stronger. The fingers of these beasts seem insensible to pain; Jacob, the London orang, in his playful moods, twisted out the strong wire of his cage and escaped more than once. Jacob did not weigh more than 250 pounds, if that. Du Chaillu, who never exaggerates the size of his gorillas, said the one in question stood 5 feet 7 inches high. Here are the measurements of a gorilla shot by Herr Paschen, in Yaunds, Cameroon, on April 15, 1900, and mounted in Lord Rothschild's museum at Tring: Height, 5 feet 6 inches; weight, 540 pounds; arm stretch, 9 feet 1 inch—and this one mass of muscle.

Who can estimate his strength? No one can, and the latest writers are wilder than Du Chaillu. Their gorilla, the latest found near Lake Kivu, in Uganda, right up to the snow-line, twists the gun into a corkscrew. That beast was small in comparison. Height, 5 feet 4¾ inches; arm stretch, 7 feet 6 inches; chest, 5 feet 1 inch.

If there be exaggeration, it may be found here: "These animals attain prodigious proportions, being at times as much as 80 inches round

the chest and 16 round the forearm, and their height reaches 7 or 8 feet" ("Captain Phillipps' Journey across Africa," *The Observer*, December 24, 1922).

The negroes kill the gorilla for meat. Fearing the ridicule of their enemies, they never keep the young they take alive. Naturalists have the greatest difficulty in getting a "boy" to attend to monkeys. But the natives have no objection to selling them to traders. Bosman prints the perennial joke: "There are negroes who affirm that these monkeys can speak, but that they will not, in order not to work." He also says: "The best thing about these monkeys is that they can be taught everything their master desires." The clever orangs and chimpanzees always owe much of their education to the traders in their native land. The chimpanzee is more nimble than the orang both in mind and movement, yet little superior in intelligence. The gorilla has a bigger brain than either, but it is sulky and morose by nature and requires great love and affection. This fact is now recognized, and several young gorillas have proved as clever and tractable as chimpanzees. John Daniel, the first of these wonders the writer saw in a hat shop in London, was as playful as a kitten; it romped among the latest creations without touching one. Its lady trainer told of many traits of wisdom—the strangest must suffice. The little fellow loved to sit in her lap, and was on the point of doing so one day when she was dressed for a visit. A lady friend said: "Don't let him spoil your dress," and John Daniel was warned off accordingly. He retired, to return in a moment with a newspaper, which he opened on her knees, and then took his accustomed seat! The animal was sold to a big circus in America. When his friend, Mr. E. H. Bostock, told the news, the writer asked him if they had bought the lady too, and received the answer "No." "Then," he said, "John Daniel will be dead in a month." Mr. Bostock agreed—as a fact we allowed two weeks too long. Friendship is more vital to gorillas than to chimpanzees, yet the whole secret of the wonderful attainments of the two Consuls—we thought the first the cleverer—lay in their being family

pets. Since Consul II learned to ride a bicycle in 1895, the world has swarmed with trained chimpanzees. It would be tedious to recount their tricks, more interesting to adduce instances of innate intelligence, which, wonderful in themselves, are likely to be surpassed in the future when more specimens live the eight or twelve years, which, in the opinion of Dr. Chalmers Mitchell, marks the limit of their mental growth. Counting was the first claimed proof of monkey development on rational lines—to the writer it seemed very much a case of self-deception; years ago he saw the famous Sally handing straws to her keeper, often the number he named, but it proved nothing; as the subject interested him greatly, he tried many chimpanzees, with little real success; they were more successful in associating the shapes of letters with food—B for banana, for example, than in understanding the meaning of one or two, but the imaginary successes were astounding. One evening the keeper repeatedly asked his charge for straws up to 15, and always got the correct number. "Now," said the writer, "do not move." He remained perfectly still, and the mystified monkey presented big numbers, little numbers, any number to try to please him. The man had deceived himself by an involuntary shadow of a move which the chimpanzee had obeyed every time. But there are definite evidences of mind: shapes are understood, keys are quickly selected from a bunch, inserted in the keyhole, and turned. A chimpanzee at Belle Vue alone, went further and made the key, fitted it to the lock, and opened the cage door. It was only a square box key made by biting a bit of wooden hoop to shape, but it implied reasoning, observation and deduction. The animal was Consul II; Consul I had been found loose in the gardens twice; the authorities imagined that he had made a key or two, and, on the basis of safety first, Consul II was never allowed to handle keys, and therefore must have observed the key in the keeper's hand, seen the result, and made the numerous necessary deductions. Nuts and bolts, whether visible or invisible, are child's play to chimpanzees.

Science News-Letter, July 20, 1929